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WASHINGTON, D. C.

Aerodynamics.

What aerodynamics can teach the civil engineer. By W. Watters Pagon. Engineering News Record. v. 112, no. 11. March 15, 1934. p. 348-353. Aeronautical research has revealed many facts which point to development of consistent theory of wind forces and their action on structures.

Agriculture.

America must choose. By Henry A. Wallace. N.Y. Foreign Policy Association; Boston, World Peace Foundation, 1934. 33p. World Affairs pamphlets no. 3. Shows clearly necessity of choosing either self-containment, full participation in world trade, or planned middle course.

Better times ahead for farmers. By Gilbert Gusler. Farmer. v. 52, no. 1. January 6, 1934. p. 3, 18. In appraising prospects for agriculture in 1934, special consideration needs to be given to: (a) Probable supply of farm products; (b) Domestic and foreign demand; (c) Probable developments in general price level; (d) Farm costs of production.

Experimental stations: Editorial. Montana Farmer. v. 21, no. 11. February 1, 1934. p. 4. There is greater need for agricultural research and experimentation, and for agricultural extension work, today than ever before.

Forty-sixth annual report of the South Carolina experiment station of Clemson Agricultural College. 1933. 189 p.

Hitler and the German farmers. By John Gunther. Successful Farming. v. 32, no. 3. March, 1934. p. 8-9, 52-55. Farm prices are fixed and crop acreage control is compulsory.

How many tons in your hay stack? Idaho Farmer. v. 51, no. 25. November 16, 1933. p. 3, 18. Up-to-date measuring methods will help you figure it up closely.

Increase in farm income. Farm Implement News. v. 55, no. 4. February 15, 1934. p. 11. Brookmire Economic Service, Inc., 551 Fifth Ave., New York, estimates that farm income for crop year, 1933-34 will be $5,525,000,000 compared with $4,310,000,000 in 1932-33.

More money per man in agriculture. By T. C. Richardson. Farm and Ranch. v. 53, no. 1. January 1, 1934. p. 2, 7, 9.

New duties confront the dealer. By W. C. Caffey. Implement and Tractor Trade Journal. v. 49, no. 3. February 10, 1934. p. 16-17, 22. Relationship with farmer under new deal means cooperation in solving problems of profits from restricted area.

Planning farm layout. By I. W. Dirkerson. Farmer. v. 52, no. 2. January 20, 1934. p. 14.

Value of scientific research to agriculture. By Henry A. Wallace. Sugar News. v. 14, no. 10. October, 1933. p. 500-504.

Vast farm relief funds assure 1934 sales for industry. Implement and Tractor Trade Journal. v. 49, no. 3. February 10, 1934. p. 13, 26. Improved morale of farmer goes hand in hand with increased purchasing power to underwrite the rehabilitization of mechanical equipment of agriculture.

What fertility means. By Asa C. Maxson. Through the Leaves. v. 22, no. 1. January, 1934. p. 3-8.

What may be done with retired land. By Joseph F. Cox. California Cultivator. v. 81, no. 1. January 6, 1934. p. 3, 12. Program directing use of retired acreage permits planting of crops for erosion-prevention and soil-improvement purposes as major uses for contracted acreage retired or to be retired. This opens way to new seedings of grasses and legumes, in accordance with their adaptation and to planting of crops to be turned under for soil-improvement purposes during period that land is contracted acreage. There is uniformity in all acreage-control contracts and also in approving resting of land, where such can be done without undue loss from erosion or growth of noxious weeds; summer-fallowing, where this practice is employed; cultivation to control weeds, where it is practical to use this method and other effective weed-control measures in subjugating quack grass, bind weeds, Canada thistle, and other noxious weeds, and planting of forest trees for farm woodlot windbreak, or forest purposes. Announced policies controlling use of acres retired from surplus crop production in connection with allotment control or rental contracts are uniform in permitting use of land for planting erosion-preventing and soil-improvement crops, permitting ground to rest or lie idle, fallowing to conserve moisture or control weeds, planting to farm woodlots and forest trees. Increase in pasturage and forage at expense of corn and other grain will tend toward reduction in total production of meat and milk, with reduction also in cost of production. Increase in proportion of pasture and meadow crops both legumes and grasses, would greatly improve our soil-fertility program, reduce losses from erosion, improve farm-management systems developed on individual farms, and extend general use of cheaper and more effective feeding rations through availability of more home-grown roughage and pasturage.

What of large scale farming? Implement and Tractor Trade Journal. v. 49, no. 5. March 10, 1934. p. 18. Low cost production equipment with larger tractor units should cause resumption of upward acreage trends prevalent before depression.

Will farming be controlled? Implement and Tractor Trade Journal. v. 49, no. 5. March 10, 1934. p. 19. Prediction of compulsory control of agriculture under quota system, unless American tariffs are lowered and growing trend toward nationalism is checked, was made by Secretary of Agriculture.

Agriculture. (Cont'd)

Wisconsin farm prices, 1841 to 1933. By W. P. Mortenson, H. H. Erdman and J. H. Draxler. 1933. 80p. Wisconsin. Agricultural Experiment Station. Research Bulletin no. 119.

Air Conditioning.

Automatic temperature control as applied to air conditioning. By R. B. Reagan. Aerologist. v. 10, no. 2. February, 1934. p. 5-7, 18. General forms of thermostats and hygrostats. Methods of control.

Awnings reduce cooling load. By L. Gwathmey. Domestic Engineering. v. 143 no. 2. February, 1934. p. 64-66. Costs are given for summer air conditioning an average residence, with and without sun shades at windows, to illustrate saving both in original equipment and in its operation.

Mollier pyschrometric chart. By Ferdinand Keppler. Refrigerating Engineering. v. 27, no. 2. February, 1934. p. 71-73, 81. Developed for the English system, with examples of its use in several fields.

Small residence air conditioning. By M. K. Drewry. Domestic Engineering. v. 143, no. 2. February, 1934. p. 69-72, 98-102. Paper indicates how it is possible to adapt air conditioning to requirements of small home where cost is main factor.

Summer cooling in the research residance, summer of 1933. Ice & Refrigeration. v. 86, no. 3. March, 1934. p. 164. Summary of paper on comfort cooling tests made during summer of 1933 in research residence at University of Illinois. Result of circulation of air taken from outdoors at night. Fan installed in attic. Out door air used to supplement cooling with ice.

Thermodynamic properties of moist air. By John A. Goff. Heating, Piping and Air Conditioning. v. 6, no. 3. March, 1934. p. 117-123.

Weather - A La Carte! American Builder. v. 55, no. 9. December, 1933. p. 41-42. Original coal fired heating equipment including heating of hot water, was operated at cost of $203 during normal winter. Oil furnace heating, including hot water, cost $159 for normal winter, including both oil and electricity. Summer hot water heating with original equipment was approximately $6 per month; with new equipment this cost has been cut to about $2.40 a month.

Associations.

Implement dealers' associations. Farm Implement News. v. 55, no. 6. March 15, 1934. p. 29. Revised to March 15, 1934.

Belts.

Belt developments and belt research. By C. A. Norman. Engineering Experiment Station News. Ohio State University. v. 6, no. 1. pt. 1. February, 1934. p. 12-13.

Belts. (Cont'd)

Eliminating stretch "stretches" fan belt life. By W. H. Van Buren. Automotive Industries. v. 69, no. 23. December 2, 1933. p. 678-679. Until fan belt manufacturer can offer belts which are elastic, yet free from permanent stretch, horsepower cannot be maintained at highest possible level. Comparative efficiency of 1933 fan belt is superficially attributable to reduction of slippage. Fundamentally, it has resulted from wiser selection of and treatment of rubber compounds and cotton cords.

Flat-belt drives. By R. W. Schuck. Electric Journal. v. 31, no. 3. March, 1934. p. 104-106. Factors governing their application.

Building Construction.

Comparative details - group 12. Exterior steps. Pencil Points. v.14, no. 11. November, 1933. p. 501-505.

Comparative architectural details. Group 13-B. More cupolas. Pencil Points. v. 15, no. 2. February, 1934. p. 81-86.

Homemade conveniences. By Mary A. Covert. 1934. 8p. South Dakota State College. Extension Service. Extension Circular no. 342.

Make it for profit. By H. Conrad Hoover. American Builder and Building Age. v. 55, no. 8. November, 1933. p. 34-35. Selected designs from a new manual prepared for the Committee on Wood Utilization of the U. S. Department of Commerce.

More data on sundials. Pencil Points. v. 14, no. 11. November, 1933. p. 507-510. Notes on dialling.

Plastering and moisture in woodwork. By L. V. Teesdale. American Builder and Building Age. v. 55, no. 8. November, 1933. p. 37, 55.

Some New England staircases, 1670-1770. By Benjamin Graham. Pencil Points. v. 14, no. 10. October, 1933. p. 445-460.

Why not a little stair standardization? By W. Markle Steen. Pencil Points. v. 14, no. 10. October, 1933. p. 465-467.

Concrete.

Permeability of concrete under high water pressure. By Cornelius C. Vermeule. Civil Engineering. v. 3, no. 11. November, 1933. p. 611-614. Record of tests on subject of permeability of concrete under water pressure exceeding 70 pounds per square inch indicate that concrete may be made impervious when mixed with cement and mortar, both of which are in excess of voids by about 20 percent. Addition of hydrated lime appeared to add water-tightness, and interval of waiting two weeks after first application of pressure also added to imperviousness of concrete.

Conservation.

Conserving natural resources. By Arthur E. Morgan. Civil Engineering. v.4, no. 3. March, 1934. p. 150-152. Coordinating hydro-electric power on Tennessee river; Prevention of soil erosion; New agricultural economy

Conservation. (Cont'd)

needed; Legal restriction on use of land.

Conserving the water: Editorial. Montana Farmer. v. 21, no. 11. February 1, 1934. p. 4. Montana is finally making start on systematic program of irrigation development under law providing for water conservation authority enacted at recent session of state legislature. New law provides for creation of state water conservation board which will construct, operate and maintain irrigation works and issue bonds to finance such construction payable from revenues of such works. Projects contemplating expenditure of more than $100,000,000 in 50 of state's 56 counties have already been submitted. Proposed projects fall into three general classifications: (1) Control and use of intermittent flood streams largely in eastern Montana, (2) Control and use of permanent flood streams, and (3) Drainage projects.

Improving the farm environment for wild life. By Wallace B. Grange and W. L. McAtee. 1934. 62p. U.S. Department of Agriculture. Farmers' Bulletin no. 1719.

Report of the President's Committee on wild-life restoration. U. S. Government Printing Office, 1934. 28p. U. S. Department of Agriculture.

Corrosion.

Corrosion studies in steam heating systems. By R. R. Seeber, F. A. Rohrman and G. E. Smedberg. Heating, Piping and Air Conditioning. v. 6, no. 3. March, 1934. p. 124-126.

Research on metals and alloys. By F. C. Frary. Industrial and Engineering Chemistry. v. 26, no. 3. March, 1934. p. 281-284. Effect of impurities in metals; Workability; Problems of melting metals; Corrosion problems.

Resistance of ferrous materials to corrosion by gaseous hydrogen sulfide. Fuels and Furnaces. v. 12, no. 1. January-February, 1934. p. 28. Paper by John Devine, C. J. Wilhelm, and Ludwig Schmidt presented at recent meeting of American Institute of Mining and Metallurgical Engineers. Summary of results obtained: (1) Steels containing 12 to 27 percent of chromium showed highest resistance to corrosion. (2) Steels containing approximately five percent of chromium showed comparatively high resistance, but somewhat less than that of high-chromium steels. (3) Nickel cast iron was indicated as having resistance superior to all other materials tested, except those mentioned above. (4) Remaining materials tested were attacked comparatively rapidly.

Cotton Ginning.

Research in mechanical phases of cotton ginning. By Charles A. Bennett. 1933. 7p. Mimeographed. U.S. Bureau of Agricultural Engineering.

Cultivation.

Advantages of deep furrow drilling. By C. H. Davey. Implement Record. v. 31, no. 3. March, 1934. p. 12-13.

Effect of tillage on eradication of cotton root rot. By H. E. Rea. Journal of American Society of Agronomy. v. 25, no. 11. November, 1933. p.764-771.

Dams.

Grouting dam foundations and construction joints. By James B. Hays. Civil Engineering. v. 3, no. 11. November, 1933. p. 606-610. Successful experience at Calderwood dam proves instructive.

Rock-crib construction on Berkshire streams. By Egbert Hans. Landscape Architecture. v. 24, no. 2. January, 1934. p. 76-81.

Drainage.

Factors that influence drain tile in subgrade installations. By F. H. Eno. Brick and Clay Record. v. 84, no. 3. March, 1934. p. 91. How to lay tile to take care of effect of capillary moisture and troublesome action of percolating water.

Historic Pontine Marshes drained. By Herbert H. Wheaton. Civil Engineering. v. 4, no. 2. February, 1934. p. 78-80. Government reclamation project near Rome, Italy, nearing completion.

Land-drainage machinery. By J. H. Blackaby. 1933. 8p. Reprinted from Engineering. December 29, 1933.

New method of field draining. Implement and Machinery Review. v. 59, no. 706. February 1, 1934. p. 848-850. Utilization of free running granular material as filling for drains which are cut by slow moving plough, material being inserted as cutting proceeds, and in this way there is provided an outlet with such conduct ability that surplus water is never allowed to lodge.

Proper spacing and depth of tile drains. By J. H. Neal. 1934. 1p. Minnesota. University. Agricultural Engineering News Letter, no. 24.

Electricity on the Farm.

Beating the drouth with electricity. By Charles E. Seitz. Electricity on the Farm. v. 7, no. 3. March, 1934. p. 7-9, 16.

Committee reports on rural electric studies. Washington Farmer. v. 69, no. 4. February 22, 1934. p. 10. Washington committee on the relation of electricity to agriculture. Main projects studied for year 1933 were value of heating water for dairy stock, potato and root washers, conclusion of study of Washington State College fruit washing machine, sprinkler evaporation studies and study of irrigation for pastures West of Cascades.

Profit from electrified dairies. By G. L. Munroe. New England Homestead. v. 106, no. 25. December 9, 1933. p. 3.

Working on new uses for electricity on the farm. California Citrograph. v. 19, no. 1. November, 1933. p. 32. Approximately 27 projects underway at Davis, California.

Erosion Control.

Erosion and watershed protection. By W. G. Hoyt. Civil Engineering. v. 4, no. 2. February, 1934. p. 81-84. Resume of problem in its practical aspects.

Erosion Control. (Cont'd)

Large-scale demonstrations to prevent soil erosion planned. The Fertilizer Review. v. 8, no. 4. October-November-December, 1933. p. 13. Details of program will vary according to needs of each project but general plan contemplates making careful survey and study of every farm included in area, accurate mapping of soil, including careful record of all slopes and recommendation to each farmer as to just how his land should be managed. Farmers will be asked to cooperate in certain phases of work and to furnish some of labor and materials that may be needed.

Note of May 1931 on silt exclusion from canals "Still Pond" versus "Open Flow". Part I. By C. C. Inglis. 1933, 7p. Bombay. Public Works Department. Technical Paper no. 45.

Pointers for building check dams in gullies. Arizona Producer. v. 12, no. 23. February 15, 1934. p.12. Tops of dams should be low enough in middle and high enough at ends to carry runoff water after heavy rains without overflowing gully banks or washing soil around ends of dams. Foundations of dams should extend far enough below bottoms of gullies so that hydraulic pressure will not force water under dams, to undermine and destroy them. Floors of gullies should be paved at lower sides of dams for sufficient length and width to prevent any erosion or undermining of dams by water dropping over crests.

Soil erosion control upon fields removed from cotton production. By S. P. Lyle. 1934. 5p. Mimeographed. U.S. Department of Agriculture. Agricultural Adjustment Administration.

Soil erosion project for Ventura. California Cultivator. v. 81, no. 1. January 6, 1934. p. 5. Sum of $125,000 will be made available for Ventura project which is to be located on some 20,000 acres of land in Los Posas Valley. Farmers must agree to permit project to be maintained during period of five years. Organization set-up will include director and advisory council. Planned to employ every known method in soil erosion control and to devise and develop such other methods as may appear to be practical in this area.

Two billion dollar annual loss. By John J. Lacey. Prairie Farmer. v. 106, no. 3. February 3, 1934. p. 1, 22. Value of fertility washed down to sea. More fertility is washed away each year than we return to the soil in the form of fertilizers in 10 years.

Evaporation.

Evaporation from soil and vegetation. Engineering News-Record. v. 112, no. 10. March 8, 1934. p. 321. Tank tests of evaporation from bare soil and soil covered with various vegetation growths, including salt grass, Bermuda grass and tule, carried out in California by Bureau of Agricultural Engineering. With water table ranging from 1 to 5 feet below surface, grasses evaporated water at rate of 43 inches to 22 inches of depth per year. These investigations and others on bare soil indicated that: (1) there is no evaporation from light-textured soil when water table is 4 feet below ground surface, and very little when it is as low as 2 feet; (2) in general, evaporation from cultivated soil is small and little importance in comparison with amounts transpired by crops and weeds; (3) salt grass and Bermude grass use about same amount of water as cultivated crops grown under

Evaporation. (Cont'd)

similar conditions; (4) although use of water by tules or cat-tails in tanks in exposed locations is not necessarily indicative of use by such plants growing in their natural environment, these plants often occupy relatively narrow strips along borders of canals and reservoirs, and there they may use as much as 12 to 15 acre-feet per season; (5) wire-rush growths use more water than either wild grasses or willows where there is high water table.

Explosives.

Formulas for using dynamite in canal excavation. By N. J. Hainovsky. Civil Engineering. v. 3, no. 12. December, 1933. p. 689.

Extension.

Extension program for 1934. By C. W. Warburton. Extension Service Review. v. 5, no. 1. January, 1934. p. 1-2, 16.

Fans, Mechanical.

Development of quiet propeller fans. By K. D. McMahan. General Electric Review. v. 37, no. 2. February, 1934. p. 82-86. Growing demand for silent operation. Noise as a factor in fan performance. Determination of air flow. Analysis of fan noises. Fan design and calculations. Tests and performance charts.

Farm Buildings and Equipment.

Adobe or sun-dried brick for farm buildings. By T.A.H. Miller. 1934. 18p. U.S. Department of Agriculture. Farmers' Bulletin no. 1720.

Barns. Building Material Digest. v. 3, no. 2. February, 1934. p.5-6.

Bull pens and proved sires. By E. T. Wallace. 1933. 4p. Purdue University. Department of Agricultural Extension. Leaflet no. 148.

Home-made hog equipment. By J. W. Schwab and G. O. Hill. 1934. 8p. Purdue University. Extension Bulletin no. 199.

Farm Machinery and Equipment.

436-bushel potato yield with tractor power. By R. U. Blasingame and A. W. Clyde. Farm Implement News. v. 55, no. 5. March 1, 1934. p. 14-17. Table A.- Typical power and labor with tractor for 1 acre potatoes. Table B. Overhead costs of tractor. Table C. Annual cost of machinery. Table D. Cost estimate per acre of work with tractor in growing 40 acres of potatoes.

Good tools, better tillage. By R. E. Stephenson. California Cultivator. v. 81, no. 3. February 3, 1934. p. 43, 63.

Home made feed mixer. By H. J. Gallagher. Quarterly Bulletin. Michigan State College. v. 16, no. 3. February, 1934. p. 133-136.

Farm Machinery and Equipment. (Cont'd)

I. H. C. is all set for the onward march of power. Implement and Tractor Trade Journal. v. 49, no. 4. February 24, 1934. p. 10-12. Wider "12" line, new "W-30", more powerful farmall "20", tractor and new diesel.

1934 machines. By J. Brownlee Davidson. Successful Farming. v. 32, no. 3. March, 1934. p. 20, 63-69. Gains in the quality of implements are noted.

Once again - trend is to power. Implement and Tractor Trade Journal. v. 49, no. 4. February 24, 1934. p. 9, 24. Tractors now available to millions of new farmers through new general purpose and smaller sized units, as AAA program puts premium on more efficient methods of production.

Farmhouses.

Rural housing survey. California Cultivator. v. 81, no. 2. January 20, 1934. p. 37. Purpose of this survey is to obtain information on farm housing conditions, which in turn will serve as foundation upon which to build program for improved farm homes. Anticipate that farm people may be able to make farm home improvements within next few years, and it is desirable to have some idea as to these needs. Survey will show what improvements are most needed in order that plans may be worked out whereby such improvements as water systems, bathrooms and built-in equipment may be installed in farm homes at low cost.

Small farm home: Editorial. California Cultivator. v. 81, no. 2. January 20, 1934. p. 25.

Fertilizers.

Acidity or basicity of fertilizers and their action on soils and soil acidity. By H. P. Cooper and W. R. Paden. American Fertilizer. v. 79, no. 13. December 16, 1933. p. 9, 22.

Commercial fertilizers in 1932-33. By G. S. Traps and S. E. Asbury. 1933. 34p. Texas. Agricultural Experiment Station. Bulletin no. 487.

Effect of fertilizers and rainfall on length of cotton fiber. By E. B. Reynolds and D. T. Killough. Journal of American Society of Agronomy, v. 25, no. 11. November, 1933. p. 756-764.

Fertilizer tests on an important pasture soil type. By A. B. Beaumont. 1934. 12p. Massachusetts. Agricultural Experiment Station. Bulletin no. 306.

Fertilizing citrus trees. By L. D. Batchelor. California Citrograph. v. 18, no. 11. September, 1933. p. 298, 308-309. Part II. Special reference to use of and supplementing of manure.

How much manure is required for a citrus orchard? By J. C. Johnston. California Citrograph. v. 18, no. 11. September, 1933. p. 295. Reasonable amount of manure, for an adequate fertilizer program would be in neighborhood of eight tons per acre where clean culture is practiced and five or six tons per acre where covercrops or weeds are grown at certain periods of year. Remarkable results are often reported from use of very large amounts of manure, but such results are possible only when fertilization has been neglected.

Fertilizers(Cont'd)

Proceeding of the ninth annual convention of the National Fertilizer Association, held at White Sulphur Springs, W. Va. June 19, 20 and 21, 1933. 1933. 21p.

Fire Protection.

Farm fire insurance. By Ray M. Koon. New England Homestead. v. 106, no. 26. December 23, 1933. p. 6. Removal of fire hazards makes vegetable properties better risk at less cost.

Floods and Flood Control.

Controlling floods along the Mississippi. By T. B. Larkin. Civil Engineering. v. 3, no. 10. October, 1933. p. 560-564. Recounting some of the complex problems met with on an immense project and progress to date.

History of flood control on the Mississippi. By E. W. Lane. Civil Engineering. v. 4, no. 2. February, 1934. p. 63-67. Essential features of various theories and plans promulgated to date.

Local flood protection rationally revised. By Thorndike Saville and Charles E. Ray, Jr. Engineering News-Record. v. 112, no. 9. March 1, 1934. p. 289-291. Old plantation levee on Roanoke River in North Carolina redesigned economically on basis of determined flood frequency and stream hydrographs.

Machines aid in combatting floods. By T. B. Larkin. Civil Engineering. v. 3, no. 12. December, 1933. p. 653-656. Excavation difficulties encountered and equipment used along Mississippi river.

Muskingum watershed improvements. By J. M. Weed. Engineering Experiment Station News. Ohio State University. v. 6, no. 1, pt. 1. February, 1934. p. 2-3, 6. Federal allotment for flood-control works within district.

Practical value of river model studies. By Herbert D. Vogel. Civil Engineering. v. 4, no. 3. March, 1933. p. 118. Results obtained at U. S. Waterways Experiment Station aid in channel improvement.

Floors.

Precast joists make low cost floors. By Henry W. Schlueter. American Builder and Building Age. v. 55, no. 8. November, 1933. p. 36, 54.

Flow of Water and Gases.

Flow of water through sand. By Gordon M. Fair. Civil Engineering. v. 4, no. 3. March, 1933. p. 137.

Seepage through foundations and embankments studied by glass models. By Hibbert M. Hill. Civil Engineering. v. 4, no. 1. January, 1934. p. 32-34.

Flumes.

Movement of bed load in a forked flume. By Herbert D. Vogel. Civil Engineering. v. 4, no. 2. February, 1934. p. 73-77. Conclusions drawn from tests at U. S. Waterways Experiment Station.

Greenhouses.

Greenhouse construction and heating. By James H. Beattie. 1934. 38p. U. S. Department of Agriculture. Farmers' Bulletin no. 1318.

Principles of greenhouse heating. By R. J. Patrick. Market Growers Journal. v. 54, no. 4. February, 1934. p. 74-76.

Heat Conduction.

Thermal conductivity experiments. By Cyril Donaldson. Engineering Experiment Station News. Ohio State University. v. 6, no. 1. pt. 1. February, 1934. p. 9-11. Investigation of thermal conductivity and heat emissivity properties of cast iron, with view to improving operation of small gasoline engines.

Heating.

Convector heaters available in many forms, materials and sizes. Part 1. Heating and Ventilating. v. 31, no. 2. February, 1934. p. 15-21. Table gives reference list of gravity convectors.

Design and location of registers and grilles. By Walter J. Ottinger. Heating and Ventilating. v. 31, no. 2. February, 1934. p. 22-24.

Hotbeds, Electric.

Controlled electric hotbeds prove best in Kansas. By Nathan Fligstein. Market Growers Journal. v. 54, no. 5. March 1, 1934. p. 112-113.

Electric hotbeds speed plant sprouting cheaply. Electrical World. v. 103, no. 7. February 17, 1934. p. 268-269. Temperatures between 80 and 90 deg. F. are most desirable for starting sweet potato plants.

Houses.

Building a house: Editorial. Aerologist. v. 10, no. 2. February, 1934. p. 4, 18. Owner should decide first of all how many rooms he is going to require and their arrangement. Second step should be design of his air conditioning equipment. Old formula of roof to shed rain, walls to support it, floors to walk upon, and windows for light and ventilation, must now give place to much broader conception. Old conception that 5% to 10% of total cost of building should be allotted for heating plant is ridiculous as viewed from our knowledge of today. If air conditioning plant cost 20, or 30, or even 50% of total cost of building, amount will not be reasonable.

"Face lifting" for ancient houses. By Genevieve Hendricks. American Builder and Building Age. v. 55, no. 8. November, 1933. p. 31-33.

Houses. (Cont'd)

U. S. A. needs 800,000 homes, says NRA. Building Material Digest. v. 3, no. 2. February, 1934. p. 20. Estimates of amount which may reasonably be spent for housing were made in two ways: 1. Ratio of new residential dwelling units to number of families during highest consecutive five years of building in the 20's was found, and it was assumed that this ratio of residential construction to families could reasonably be initiated and maintained at present time as result of current shortage. 2. Need for new residential dwellings was calculated on basis of increase in urban families, estimated return of families to city upon recovery, replacement of abandoned homes, homes burned and not replaced, obsolescence and estimates on number of substandard homes in 1929 to be replaced by new construction. Report estimated average cost of each family unit at $2,200 making contemplated housing program of $4,532,000, or two years of residential building at rate of $200,000,000 per month.

Hydraulics.

Hydraulic jump in standard conduits. By J. C. Stevens. Civil Engineering. v. 3, no. 10. October, 1933. p. 565-567. General formula for rectangular channels extended to trapezoidal and curvilinear sections.

Ice.

Harvesting and storing ice on the farm. By John T. Bowen. 1933. 25p. U. S. Department of Agriculture. Farmers' Bulletin no. 1078.

Insulation.

Metal heat insulation. By Joseph LeGrand. Refrigerating Engineering. v. 27, no. 2. February, 1934. p. 78-79, 8[illegible]

Physical properties of ten brands of insulating refractories. By W. C. Rueckel. Brick and Clay Record. v. 84, no. 3. March, 1934. p. 89-90. Progress report of investigation from which classifications and specifications for ceramic insulation will be developed.

Irrigation.

Insulation and air conditioning. By X. Vigeant. Aerologist. v. 10, no. 3. March, 1934. p. 25-28, 45.

Value of water in Southern California. By Franklin Thomas. Civil Engineering. v. 3, no. 10. October, 1933. p. 555-559. Historical resume of the cost of its development for irrigation and domestic use.

Land.

Land-use program for rented acreage. By J. F. Cox. Extension Service Review. v. 5, no. 1. January, 1934. p. 3. What can be grown under production adjustment contracts of the Agricultural Adjustment Administration.

Land Utilization: Editorial. Canadian Engineer. v. 65, no. 26. December 26, 1933. p. 14. At meeting of Royal Canadian Institute in Toronto on November 4, Dr. Dudley Stamp, of University of London, gave interesting

Land. (Cont'd)

address on work of Land Utilization Society of Great Britain. Organization has undertaken to make survey of all land in Great Britain to ascertain how it is used at present time so that plans may be prepared for more economic use in future with object of increasing production of domestic food stuffs, and in this way providing some employment for many who are displaced by changes in industrial and manufacturing processes. Work has been undertaken largely as means of providing employment in future and making nation more secure in its food supply.

Lighting.

Better farm lighting is possible. By F. R. Jones. Farm and Ranch. v.52, no. 23. December 1, 1934. p. 2. Good lights and lighting equipment are extremely important and essential.

Lighting revolutionized by science of seeing. By Matthew Luckiesh. Electrical World. v. 103, no. 7. February 17, 1934. p. 263-268. No longer are problems in production and control of light major tasks of illuminating engineer. Today's objective becomes specification of lighting which will meet complicated interrelationship of physiological and psychological factors.

Maps.

Topographic mapping by a combination method. By W. N. Brown. Civil Engineering. v. 3, no. 12. December, 1933. p. 684-687. Plane table supplements aerial photography with gratifying results.

Meters.

Automatic meter for measuring the outflow from field drains. 1934. 4p. Institute for research in agricultural engineering, University of Oxford. Reprinted from Engineering. January 19, 1934.

Use of current meters for precise measurement. By Floyd A. Nagler. Canadian Engineer. v. 66, no. 3. January 16, 1934. p. 12. Meters adapted for measuring flow in low-head plants. Behavior in turbulent water.

Vibration meter for earthquake studies buildings. By N. H. Heck. Engineering News-Record. v. 112, no. 10. March 8, 1934. p. 315. Instrument has not yet been used for earthquake studies but has been tested by measuring vibrations of tall building in Baltimore during 30-mile (average) wind. Observations can be made only during light earthquakes or high winds, but they could be made at any time if device for putting building into controlled vibrations were available.

Miscellaneous.

Enjoyable jobs for leisure hours. By Mary A. Covert. 1933. 11p. South Dakota State College. Extension Service. Extension Circular no. 340.

Forty-seventh convention of the Association of Land-Grant Colleges and Universities. Experiment Station Record. v. 70, no. 1. January, 1934. p. 1-5.

Miscellaneous. (Cont'd)

Principal sources and uses of state and county revenues in Alabama. By James D. Pope. 1934. 8p. Alabama. Agricultural Experiment Station. Circular no. 63.

Repeal of entire federal gas tax urged on House Committee. National Petroleum News. v. 25, no. 52. December 27, 1933. p. 11. Federal Government now has sources of tax revenue which it did not have when it adopted gasoline tax as an emergency measure. Billions that are being spent by federal government, outside of its ordinary budget, have their justification in emergency effort to break depression. Wisdom of that policy is of course not an issue here. But effort is being made in behalf of all of American people, not of any special class. That requires that necessary taxation be equitably levied upon all taxpayers, and if commodity taxation is resorted to, upon practically all commodities. There is no justification for selecting single commodity, already over-taxed by States, to bear wholly undue share of cost of recovery.

Rural social organization in the rice area. By T. C. McCormick. 1933. 43p. Arkansas. Agricultural Experiment Station. Bulletin no. 296.

Sixteenth annual report of the National Research Council, 1932-1933. 113p. Ottawa, Canada.

Sixth report of the United States Geographic Board, 1890 to 1932. Washington. United States Government Printing Office, 1933. 834p.

Social insurance. American Academy of Political and Social Science. Annals. v. 170. November, 1933. Consideration of principles, practicability, and effects of social insurance, with additional papers presented before Academy of World economics. Unemployment insurance or compensation; Old age pensions.

Statesmanship and religion hand in hand. By Henry A. Wallace. Farm and Ranch. v. 53, no. 1. January 1, 1934. p. 1, 4, 13. Man must develop the capacity to envision a cooperative objective and be willing to pay the price to achieve it.

Topical index of population census reports, 1900-1930. Washington, 1934. 75p. Multigraphed. U. S. Bureau of the Census.

What the government monetary program means to business - to investors. By Theodore M. Knappen. Magazine of Wall Street. v. 53, no. 8. February 3, 1934. p. 382-384, 421-422.

Motors.

Electricity facts. By R. C. Allen. Domestic Engineering. v. 143, no. 2. February, 1934. p. 75-78, 102-103. Discussion of motors.

Multi speed reduction unit with direct drive for electric motor operation. By H. J. Gallagher. Quarterly Bulletin. Michigan State College. v. 16, no. 3. February, 1934. p. 130-132.

Small motors for air conditioning plants. By L. Gwathmey and B. S. Weaver. Heating and Ventilating. v. 31, no. 2. February, 1934. p. 32-34.

Painting.

Painting tips. By Laurance Shortridge. Building Material Digest. v. 3, no. 2. February, 1934. p. 10, 18.

Pipes and Piping.

Fabrication of oxwelded piping. New York, Linde Air Products Company, 1933. 156p.

Interior water supply piping for residential buildings. By Francis M. Davison and James S. Bowman. 1933. 54p. Wisconsin. Engineering Experiment Station. Bulletin no. 77.

What size piping for one pipe steam system? By Wm. W. Stevens. Domestic Engineering. v. 143, no. 1. January, 1934. p. 30-31.

Plows and Plowing.

Selection of plows from tests made. Wisconsin Agriculturist and Farmer. v. 61, no. 2. January 20, 1934. p. 11. Engineers are studying soil constants and plow characteristics to find out type of plow best suited economically for different types of soil - plow that will work with least draft consistent with good pulverization and trash coverage. Some of factors affecting draft are depth of plowing, width of plow, character of soil, moisture, shape of moldboard, sharpness of share, hitch, and speed. Tests so far made indicate that for minimum draft with tractor plows in average soil conditions, hitch should be as high on tractor and as low on front of plow as possible and still have plow hold desired depth. Indications are that plow bottoms having steeper moldboards have heavier draft. Influence of shape seems to be slight, and is often less than variation between tests made with same bottom. Outstanding research work is carried on at four state agricultural experiment stations. At Alabama, laboratory studies are made of soil reactions, of moldboard curvatures, and of constants of various plows and their relation to soil properties and effect on pulverization, draft, throw and other factors. At Ohio and Mississippi stations, draft tests are made of plows and various tillage tools in different soil types and with use of fertilizer, cover crop and pretreatments. At Minnesota engineers are trying to establish method of determining accurately pulverization of furrow slice, which data they will correlate with sizes and types of bottoms, rates of travel and soil types.

Power.

From horse, to tractor, to where? Farm Implement News. v. 55, no. 6. March 15, 1934. p. 16-18. Always world trend seems to force further specialization and more complex methods and equipment.

Power generation on the All-American canal. Power Plant Engineering. v.38. no. 3. March, 1934. p. 148. New canal will be higher with new diversion dam about 25 miles higher up on river. This dam will be of floating or Indian weir type with crest 1700 feet long. Six desilting basins are provided, any five of which can be used while sixth is being sluiced. River surface will be raised 22 feet. Capacity of main canal is 15,000 second feet from dam to Siphon Drop, where 2000 second feet are diverted for Yuma irrigation project. Small power plant operating under head of about 10 feet

Power. (Cont'd)

is already installed at this point and develops about 1000 kw. at cost of about 0.8 cents per kw. hour. Surplus power is sold and net benefit of this plant amounts to about $54,000. per year. From Siphon Drop to Pilot Knob canal capacity is 13,000 second feet, and drop available for power from diverted water is from 50 to 60 feet. Capacity of canal from this point on toward Imperial Valley is 10,000 second feet.

Prices.

Wholesale prices of all commodities in the United States, England and Canada, 1929 to 1933. 1934. 16p. Oklahoma. Agricultural Experiment Station. Current Farm Economics. Series 49, v. 7, no. 1.

Pulleys.

Figuring pulley sizes. Farm Implement News. v. 55, no. 6. March 15, 1934. p. 18. Multiply diameter of tractor pulley by number of revolutions per minute of tractor pulley and divide this sum by recommended revolutions of driven machine.

Pumps and Pumping.

Drawdown-capacity curves for water wells. By H. C. Schwalen. Civil Engineering. v. 4, no. 1. January, 1934. p. 10-11. Typical curve forms and their interpretation for selection of pumping machinery.

Reclamation.

Conflict over formal agreements delays reclamation work. Engineering News-Record. v. 112, no. 9. March 1, 1934. p. 293. Work has been delayed or entirely held up through conflict between parties interested in projects, or through failure to complete negotiation of repayment agreements. Experience indicates that reclamation projects, like most other public-work projects, cannot be expedited if normal government safeguards are to be maintained. Also, emergency program in reclamation field is confronted by much same conditions and is held up by same complications that have delayed such work in past. Details of total allotment of $103,875,000 are given.

Owyhee project progress notes. Engineering News-Record. v. 112, no.9. March 1, 1934. p. 293. Present program contemplates possibility of watering some of lands under Kingman and Mitchell Butte laterals in 1935, and continuing North Canal on to completion as rapidly as possible; after which South Canal system, serving Gem District, is to be built.

Pioneering in power is key that opens a new era in the Pacific Northwest. Idaho Farmer. v. 51, no. 25. November 16, 1933. p. 10-11. Relief map of Columbia and Snake watershed designed to show sources and courses of these mighty streams; sites of two great dam projects recently authorized by Federal Government; sites of many other dams already completed or in future prospect, and location of larger cities in three important areas of region.

Principles governing the reclamation of alkali soils. By W. P. Kelley and S. M. Brown. 1934. 149-177p. California Agricultural Experiment Station. Hilgardia. v. 8, no. 5.

Reclamation. (Cont'd)

Reclamation work for Montana. By Elwood Mead. Montana Farmer. v. 21, no. 11. February 1, 1934. p. 5. Bitter Rood project $100,000; Sun River project $600,000, and Milk River project $2,065,000.

Refrigeration.

Cooling with ice in California interior valleys. By H. L. Lincoln. Ice and Refrigeration. v. 86, no. 2. February, 1934. p. 127-131. Discussion of temperature conditions with reference to amount of cooling required in buildings. Question of wet bulb temperature and relative humidity very important. Paper not only gives complete details of design and operation of air conditioning system to meet unusual requirements but also describes use of outside air near the minimum temperature to effect saving in refrigeration required. This work is forerunner of similar methods applied to other air conditioning jobs.

Data on properties of refrigerants. Refrigerating World. v. 69, no. 1. January, 1934. p. 14-17.

Refrigeration and air conditioning. By William Goodman. Aerologist. v. 10, no. 3. March, 1934. p. 19-20. Impressions of principal refrigerating means available today, and outstanding advantages and disadvantages of each.

Research.

History of the National Research Council, 1919-1933. 1933. 61p. National research council. Reprint and circular series, no. 106.

Research at the 1933 meeting of the Association of Land-Grant Colleges and Universities: Editorial. Experiment Station Record. v. 70, no. 2. February, 1934. p. 145-149. Frank recognition of changed situation and willingness to accept full share of desirable readjustments in emphasis and viewpoint. Meeting was also very helpful in demonstrating continuing need of fundamental research as basic necessity in meeting adequately new problems of day. It indicated concretely and unmistakenable how indispensable agricultural experiment station system has become as permanent fact-finding agency, equipped and ready for unique and essential service to Nation in this direction.

Retaining Walls.

Large retaining-wall tests. By Karl Terzaghi. II. Pressure of saturated sand. Engineering News-Record. v. 112, no. 8. February 22, 1934. p. 259-262. Lateral pressure of submerged sand fill is full water pressure plus lateral pressure of solid fraction, allowing for reduction of effective weight by buoyancy.

Large retaining-wall tests. III. Action of water pressure on fine-grained soils. By Karl Terzaghi. Engineering News-Record. v. 112, no. 10. March 8, 1934. p. 316-318. As with submerged sand, retaining wall backfilled with fine-grained soil such as till or clay receives full water pressure plus pressure of solid fraction of fill.

Rivers.

Canalizing the Mississippi for 9-ft. navigation. Engineering News-Record. v. 112, no. 10. March 8, 1934. p. 322-324. Plans for locks and dams for slackwater navigation between St. Louis and the Twin Cities, begun with $33,500,000 PWA appropriation, is one of the greatest river improvement projects in the world.

Roofs.

Metal roofs for buildings. By K. J. T. Ekblaw. New England Homestead. v. 106, no. 25. December 9, 1933. p. 6. Can be used on almost any kind of farm building, from a garage to a residence.

Septic tanks.

Septic tanks for farm homes. By H. L. Belton and J. P. Fairbank. 1933. 20p. California. Agricultural Extension Service. Circular no. 82.

Soils.

Fashions in soil survey. By Robert L. Pendleton. Sugar News. v. 14, no. 10. October, 1933. p. 488-493. Trends in soil survey methods. Arrhenius' survey methods. Pasoeroean "Genetic" method. Soil mapping aided by standards for color and heaviness. Bureau of Soils method continues the most generally suitable.

Review of soil-bearing test for Columbus water tanks. By F. S. Besson. Engineering News Record. v. 112, no. 11. March 15, 1934. p. 345-346. Failure to follow basic principles of soil mechanics vitiates test results on several important counts.

Subsistence homesteads.

Subsistence-homestead movement under National Recovery Act. Monthly Labor Review. v. 37, no. 6. December, 1933. p. 1327-1330.

Subsistence homesteading. By Robert W. Hartley. Engineering Experiment Station News. Ohio State University. v. 6, no. 1, pt. 1. February, 1934. New note in economic compromise.

Sugar Beets.

Cross blocking sugar beets by machinery. By S. W. McBirnie. Implement Record. v. 31, no. 3. March, 1934. p. 11. Requirements: First cost small and implement easily adapted to specific conditions. 2. Cost of blocking by machine should be less than with hand methods. 3. Work should be done as well as that done by hand or better. 4. Tilth of soil should be improved. 5. It should be possible to operate equipment so that effective weed control clean cross blocking are accomplished.

Important sugar-beet byproducts and their utilization. By A. W. Skuderna and E. W. Sheets. 1934. 29p. U.S. Department of Agriculture Farmers' Bulletin no. 1718.

Mechanical blocking best for sugar beets. Idaho Farmer. v. 51, no. 28. Dec. 28, 1933. p. 7. Reduces cost of production by substituting for part of slow, expensive and tedious hand operation, cheaper and quicker

machine operation. Also saves from 10 to 40 per cent of time required for blocking and thinning by hand. Mechanical blocking causes less shock to plants and less mortality than hand methods, gives more uniform stand and provides cross cultivation. Moreover it tends to increase harvest yield by overcoming tendency of hand blocker to chop out bunch of vigorous beets and leave single plant, possibly a small one. Timely blocking removes competition of surplus plants as well as of weeds and conserves soil moisture and plant food for growth of selected plants.

Surveying.

Simplified peg method for adjusting engineer's level. By Richard Bennett. Engineering News-Record. v. 112, no. 8. February 22, 1934. p. 253. Four stakes are set in measured straight line, 150, 75 and 75 feet apart respectively, and for reference purposes are called A, B, C and D. Instrument is set first at point C, midway between points B and D, which are approximately on same level. Site should be selected with this idea in mind. Plug is firmly driven at B to any convenient height, and its elevation below instrument is noted. Instrument is revolved 180 degrees, releveled, and plug D is set with top at same elevation as B, with readings a and b equal. Level is next set at point A. If line of sight and bubble is in center of tube, rod readings B" and D" are equal. But in example shown, line of sight points down, rod readings being B' and D', respectively. To determine rod readings for B" and D", find difference in rod reading of B' and D' by subtracting last from first, and this sum added to B" gives correct elevation for B", D" and also for instrument.
B' + (B' - D') = B" = D" = height of level. Line of sight should now be brought to read B" D" by leveling screws. Bubble will move out of center of its tube and should be brought back to center by bubble adjusting nuts. When this last adjustment is completed, bubble tube will be parallel to line of sight because both are horizontal.

Tanks.

Design of cylindrical concrete tanks. By Laverne Leeper. Civil Engineering. v. 3, no. 11. November, 1933. p. 598-600. Slide-Rule formulas for accurate stress analysis of tanks with fixed bases. Gives derivation of stress formulas based on exact theory, and then introduces modifications to simplify these formulas and make them more usable.

Tennessee Valley Authority.

Nation's social experiment in Tennessee Valley. By Theodore M. Knappen. The Magazine of Wall Street. v. 53, no. 7. January 20, 1934. p. 338-340, 371-372. Power regulation and social reconstruction combined in gigantic venture.

Tennessee Valley Authority. 1932. 8p. Issued by Tennessee Valley Authority, New Sprankle Building, Knoxville, Tenn.

Terracing.

Terracing program that builds terraces. Extension Service Review. v. 5, no.1 January, 1934. p. 8. Inaugurated in Tallapoosa County, Alabama. Program is cooperative in nature. Though farmers of county are paying entire cost, work is made possible through initiative and assistance given by their county government. Farmers who wish their land terraced apply to Soil

Erosion Club. When work is done by one of tractor outfits, farmer is charged with total cost, including labor, fuel and depreciation. In this way program is made self-liquidating, meaning that there will be no cost to county government, but that entire cost will be borne by landowners whose farms are terraced. Charge for terracing runs from $1. to $2.50 per acre, depending on slope of land, number of terraces needed, and other similar factors. It is expected that from 4,000 to 6,000 acres will be terraced this season.

Timber.

Guide to the grading of structural timbers and the determination of working stresses. By T.R.C. Wilson. 1934. 27p. U. S. Department of Agriculture Miscellaneous Publication no. 185.

Tires.

Comparative field tests in Kansas of rubber tires and steel wheels. By Frank J. Zink, E. L. Barger, June Roberts, and T. E. Martin. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 51-54. Brief conclusions may be drawn from data taken and observations made: 1. Rubber tires were more efficient at higher speeds. 2. Decreased rolling resistance was largest single factor responsible for increased efficiencies of rubber tires. In all tests average rolling resistance of rubber tires was but 47.41 per cent of that of regular steel wheels. 3. Slippage of rubber tires was 16.6 per cent less than that of steel wheels. 4. It was observed that jarring and vibration when operating over hard or rough ground were eliminated with rubber tires. 5. Under most conditions comfort of operator was greatly increased by rubber tires. 6. Certain field conditions such as cross-travel on row-crop fields resulted in rebounding or bouncing with rubber tires that was more severe than with steel wheels. Certain load conditions in some cases near full-load point also produced rhythmic rebounding with rubber equipment. 7. Relative efficiencies of rubber tires and steel wheels were greatly affected by tractor speeds, loads, and ground conditions. Greatest differences appeared when conditions are such that it was possible to handle load at higher speed with rubber tires than with steel wheels. 8. Fuel savings made possible by use of rubber tires was appreciable and for nine tests averaged 12.98 per cent. This saving was due largely to decreased rolling resistance. 9. Rubber tires caused much less dust to be stirred up in dry fields. In some of the tests with steel wheels it was necessary to stop and let dust clear away in order to see to turn at ends, while with rubber tires this was not necessary.

Comparative study of pneumatic tires and steel wheels on farm tractors. By C. W. Smith and Lloyd W. Hurlbut. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 35-48. Comparison of pneumatic tires with steel wheels on following farm operations: 1. Cultivating listed corn first time over. 2. Cultivating listed corn second time over. 3. Cultivating listed corn third time over. 4. Mowing alfalfa hay. 5. Mowing wild prairie hay. 6. Sweeping alfalfa hay. 7. Sweeping wild prairie hay. 8. Binding oats. 9. Combining wheat. 10. Plowing barley stubble. 11. Plowing wheat stubble. 12. Plowing sweet clover. 13. Plowing alfalfa sod. 14. Drilling wheat. 15. Picking corn. Less field dust when using rubber tires. Rubber tires render good service in "sweeping" hay. Tractors travel at higher speed with rubber. Tests on Nebrasks tractor testing course. Data taken with different sizes of wheel weights.

Farm tests of low-pressure tractor tires. By Fred W. Hawthorne. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 61, 63. In summing up my experiments with rubber tires, would say that rubber-tired tractor will turn out around quarter more work in given time than same machine equipped with steel wheels, and this with corresponding fuel saving. When working on hills rubber tires not only add greatly to surplus power so badly needed on steep grades, but they also materially improve steering and general handle-ability of tractor on steep side slopes. Ability of rubber-tired tractor to travel at high speeds over hard-surfaced roads should open up possibilities of use as hauling unit. Last, but not least, rubber tires add much to personal comfort and pleasure of tractor operation.

Field test of rubber-tired tractor wheels. By R. I. Shawl. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 57-58.

Field tests of air wheels for tractors. By F. L. Fairbanks. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 74.

Idaho drawbar tests of rubber tires. By Hobart Beresford. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 65, 68. Object of this study was to determine what effect different types of traction wheels would produce on maximum drawbar developed by wheel-type tractor when used on different soil surfaces. Table gives data from Idaho tractor field tests.

Plowing with rubber-tire-equipped tractor. By A. J. Schwantes. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 66-68. Table gives date from comparative plowing test using same tractor equipped with pneumatic tires, zero-pressure tires, and steel wheels and lugs.

Pneumatic tires vs. steel wheels for tractors. By R. H. Wileman. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 62-63. Summary. These comparative tests of steel wheels and lugs versus low-pressure pneumatic tires made under actual field working conditions as previously outlined show following points: 1. When equipped with pneumatic tires, tractor pulled same load at faster speed than when steel wheels were used. 2. Amount of fuel required for plowing was reduced 13.9 per cent with large tractor and 14.3 per cent with small tractor in high gear by use of pneumatic tires. 3. With low speeds and heavy loads amount of fuel saved by pneumatic tires over steel wheels is considerable reduced. 4. Power consumed to overcome rolling resistence of tractor itself when equipped with pneumatic tires was reduced 60.8 per cent for large tractor and 43 per cent for small tractor. 5. Saving of 20 per cent in fuel was secured by use of pneumatic tires for cultivating. 6. In plowing sod with considerable growth, or when surface was slick, use of skid chains was necessary to secure sufficient traction. 7. Although nor measured, operator readily noticed greater ease of handling and riding qualities of tractor when equipped with pneumatic tires.

Rubber tires and speed. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 74.

Rubber tires for free-wheeling uses: Editorial. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 76. Since most farm machines are used successively rather than simultaneously, and number which can possibly be used at one time is limited by tractor or other power units available, small number of rubber tires might serve whole list of equipment if they were easily and quickly interchangeable. In such development, tire and wheel should be unit.

Rubber tires on tractors and cane wagons. By Harold T. Barr. Agricultural Engineering. v. 15, no. 2. February, 1934.

Summary: pneumatic rubber tires on farm equipment. By Walter B. Jones. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 49-50. Applications seem to have sufficient advantages and annual use to promise economic justification for rather general adoption throughout United States. Same may be said as to ground wheels of field implements or machines with which rolling resistance is dominating factor in successful operation, or where product of annual usage with efficiency gain justifies fixed charges on investment. Standardized, interchangeable wheels used in succession on sundry units might extend usefulness of rubber tires in this class of service. Where ground adhesion for traction is required, no such generalization can be made in present state of knowledge and development. It seems likely that there may be one zone of adaptability for rubber tires and another for lugged steel wheels, as has long been true of adaptations of chilled and steel plows. To extent that soil conditions influence adaptability of rubber tires, there may even be a degree of coincidence in field of rubber tire and chilled plow. It seems certain, however, that field for rubber tractor tires is large enough to warrant continued and intensive engineering study, and to justify vigorous, though discriminating commercial exploitation.

Tests in Texas of pneumatic tractor tires. By F. R. Jones. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 73. General observations and conclusions are as follows: 1. Steel wheels and spade lugs gave greater maximum drawbar pull than pneumatic tires on both sod and plowed ground. 2. Steel wheel has change in radius with increased drawbar pull, but no attempt was made to measure change. 3. If radius of steel wheel is considered to be constant and change in radius of rubber-tired wheel taken into account, steel wheels and rubber-tired equipment gave approximately same per cent slippage from 1200 to 1800 pounds when on Bermuda sod. 4. Change in corrected slippage from slippage obtained from observed data was in no case more than 1.9 per cent slippage. 5. On Bermuda sod 12 pound air pressure gave considerably better traction than 20 pound air pressure. 6. Tractor pulled more and gave less slippage on Bermuda sod with both types of wheel equipment. 7. On rough sod there was considerable bouncing on rubber-equipped tractor which tended to increase slippage. 8. Use of chains on Bermuda sod did not seem to produce any appreciable improvement in traction. 9. On plowed ground there was very little difference as to slippage and load as far as change in air pressure was concerned. 10. Tires although they were slipped considerably on sand and gravel, did not show appreciable amount of wear as far as observation was concerned. 11. Small changes of moisture content of top layer of soil makes more difference in slippage of rubber-equipped tractor than steel wheel tractor. 12. Tests indicated that when pulling same load at different speeds, there was increased slippage with increased speed. Whether there is definite ratio or not is still uncertain from results so far obtained. 13. It was noted that to start load there was more slippage than after load was started. 14. On most surfaces lower inflation pressure permits tire to flatten somewhat and secure better traction. 15. Since pull per plow bottom requires 600 to 1000 pound draft, and since tractor is essentially two to three-bottom tractor, there would be little difference in wheel slippage with two-bottom plow if pulled at same speed and under similar conditions.

Tests of pneumatic and cushion rubber tires for tractors. By A. W. Clyde. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 69, 71. Pennsylvania Agricultural Experiment Station.

Tires. (Cont'd)

Tractive performance of pneumatic tires and steel wheels. By B. D. Moses and K. R. Frost. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 55-57. Summary: 1. Pneumatic rubber tire had decided advantage over steel wheel in fuel consumption at higher speeds. 2. Higher per cent of rated drawbar pull can be developed in second and high gears with rubber tires than with steel wheels. 3. Steel wheels with lugs showed higher per cent of drawbar pull in low gear. 4. Slippage is controlling factor limiting load drawn with rubber tires, while steel wheeled tractor is limited by power of engine. 5. Maximum horsepower is increased when gear changes are made to higher speeds with rubber-tired tractor; it is decreased with steel wheels. 6. At any given per cent of rated drawbar pull, rubber-tired tractor is more economical for each gear ratio on either firm or cultivated soil. 7. Fuel required to move tractor without load is less with rubber tires than with steel wheels and lugs. Rubber tires roll with less resistance on firm soil; steel wheels, on cultivated soil.

Tractor tests of steel and rubber tires. By Evan A. Hardy. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 70-71. Table gives test data on use of rubber tires in Saskatchewan.

Wheel and bearing equipment for farm wagons and trailers. By E. A. silver. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 59-60. Specifications for wood and steel wheels. Specifications for rubber-tired wheels. With equipment at hand it was possible to get following relationships: 1. Relative draft of various loads at various speeds on five tractive surfaces, together with their effect on soil compaction. 3. Diameters and widths of rim with reference to draft and soil compaction. 4. Effect of plain, roller, and wagon skein type of bearings on draft of wagon.

Wisconsin observations of rubber tire performance. By F. W. Duffee. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 58-59. In conclusion, we have sized up the proposition in this way: For man who has considerable custom work to do, such as threshing, silo filling, or other work that takes him on the highway, this equipment would be of great value and very probably would be equipment for him to purchase. Advantages of rubber tire equipment under these conditions would more than offset disadvantages of rubber tire equipment for field conditions. On other hand, for man who has work on his own farm only to do, or where practically all of it is confined to his own farm, we believe that steel tire equipment would be economically and mechanically superior to rubber tire equipment. Just where dividing line would be between these two groups is hard to say at present time, and it will require at least another year or two of experience in hands of many users before more definite conclusions can be arrived at.

Tractors.

Awaiting tractor designed for rubber tires: Editorial. Agricultural Engineering. v. 15, no. 2. February, 1934. p. 76. Until that is done rubber-tired tractor will not develop its full efficiency, nor can we predict with any accuracy what performance may be expected when entire unit is engineered from start on rubber-tire basis. Tire and wheel manufacturers have done commendable and commercially practical job of developing and standardizing few sizes of tire with which nearly all current-model tractors may be equipped. These standards should be regarded as temporary makeshifts. But before these makeshift tire standards are discarded or augmented, and preferably before any real rubber-tired tractors are put into production,

Tractors. (Cont'd)

there might well be some studies - something approaching pure research - of the soft rubber tire as traction device. Such studies should develop data on tire itself, and on its relationships with sundry types and conditions of soil.

Sees a sharp upturn for industry. Implement and Tractor Trade Journal. v. 49, no. 3. February 10, 1934. p. 12. Standard Statistics Co., finds many encouraging factors to indicate possible replacement market for 50,000 tractors and total domestic volume as high as $200,000,000.

Tractor trials in Hampshire. Journal of the Ministry of Agriculture. v. 40, no. 9. December, 1933. p. 797-799. Trial ground consisted of 8 acres of light, dry, easy working loam, situated on slight slope, up and down which tractors were tested. Fordson Tractors with open type wheels Fordson tractors with pneumatic-tyred wheels. New "Bristol" tractor. Pitch-pole harrow.

Tractors take to the highways. Implement and Tractor Trade Journal. v. 49, no.3. February 10, 1934. p. 14-15. New air tires place farm power units in transportation field.

Turbines.

Heat rates for condensing turbines. By Norris D. Gove. Power Plant Engineering. v. 38, no. 3 March, 1934. p. 122-124. Heat rate which can be converted directly into coal figures is used as basis of charts which allow rapid compaison of performance to be expected under various operating conditions.

Walls.

Tests of the fire resistance and strength of walls of concrete masonry units. By Carl A. Menzel. 1934. 215 p. Portland Cement Association. Chicago, Ill. Covers studies of relative influence of such factors as type and grading of aggregate, cement content, design of unit, type of mortar, workmanship, and application of plaster.

Water, Underground.

Underground waters of Ohio. By Wilbur Stout and R. E. Lamborn. Engineering Experiment Station News. Ohio State University. v. 6, no. 1. pt. 1. February, 1934. p. 15-20.

Water Systems.

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